

Dear Z43 Partners, Friends, and Followers

As Switzerland enters its fourth month since the COVID-19 outbreak, with fluctuating infection rates across the country, we are slowly returning to normal operations at Z43. Thankfully, due to our flexible approach and extra precautions, we have been able to continue our activities without any major interruptions or delays for our research output and products – the highlights of which are summarized below. We hope you have a great summer. Please stay safe!



VIRTUAL POPULATION

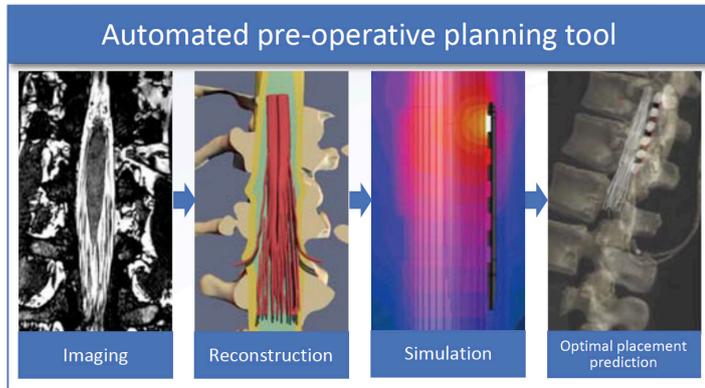
2020 SPARC Ideas Lab



From April 20 – 24, 2020, the SPARC Ideas Lab took place as a virtual workshop, hosted by the IT'IS Foundation, with funding from and in partnership with the National Institutes of Health (NIH) Common Fund's Stimulating Peripheral Activity to Relieve Conditions (SPARC) program. The aim was to bridge the gap between experimental data collection in SPARC and the creation of computational models of organ physiology and autonomic control. Thirty interdisciplinary experts from various backgrounds, including data scientists, mathematical modelers, engineers, experimental scientists, and clinicians, that were supported by the facilitator and mentors, made the multiday event an energizing, high-quality scientific working experience. By the end of the week, new teams had formed that will jointly write eight proposals on intriguing novel ideas.

INTERNATIONAL PROJECTS

"PREP2GO" Project Kickoff



ZMT and IT'IS are part of the Eurostars project "PREP2GO: Pre-Operative Planning System for Neuromodulation Surgery for Spinal Cord Injury Rehabilitation." The goal of PREP2GO is the development of a new preoperative workflow for spinal cord injury rehabilitation with a supporting analysis and planning system that is based on deep learning and computational modeling and that can easily be adopted by clinical centers. The project is a follow-up to the successful Eurostars project [RESTORE](#).

MEASUREMENT

Two cDASY6 Releases: New API & Smart Zoom Scan

During the last few months, the cDASY6 software and application teams have been extremely busy pushing the automatization, speed, precision, and reliability of specific absorption rate (SAR) evaluations even further. The release of cDASY6 V6.12 provides a new application programming interface (API) for customized automatization plus the additional features needed for 5G New Radio (NR) Frequency Range 1 (FR1) communication systems compliance testing. The release V6.14 added the *Smart Zoom Scan* that optimizes its own scanning parameters, reduces the measurement time, makes rescans unnecessary, and is always compliant with SPEAG's uncertainty budget.



MEASUREMENT

mmWave THG-Phantom Package



SPEAG started to collaborate with the manufacturers of 3GPP-compliant compact antenna test ranges (CATR) and CTIA to develop phantom solutions suitable for over-the-air (OTA) testing over a very wide frequency range (6 – >110 GHz) and covering all frequencies of 5G NR FR2 and beyond. We have recently released the mmWave two-hand-grip phantom package (mmW-THG-V6 package) with a fixture designed to be compatible with any mmWave compact antenna test ranges with a quiet zone of 30 cm or larger. Check out this video! [mmWave video](#).

Z43 SOCIAL

PhD Thesis Defense

At the beginning of May, Hazael Montanaro successfully defended his doctoral thesis entitled “Multi-Scale, Image-Based Modelling and Optimization of Neurostimulation by Extrinsic Electric Fields and Focused Ultrasound.” Via the work described in his thesis, Hazael extended, validated, and innovatively applied the Sim4Life simulation platform for electromagnetic and acoustic neurostimulation modeling to multiple emerging and highly promising therapeutic approaches.



RESEARCH

PUBLICATIONS

Transducer Modeling for Accurate Acoustic Simulations of Transcranial Focused Ultrasound Stimulation
C. Pasquinelli et al., 2020, *Journal of Neural Engineering*, doi: 10.1088/1741-2552/ab98dc (online 2 June 2020)

Assessment of Exposure to Electric Vehicle Inductive Power Transfer Systems: Experimental Measurements and Numerical Dosimetry
I. Liorni et al., 2020, *Sustainability*, 12(11):4573, doi:10.3390/su12114573 (online 3 June 2020)

Modeling Intracranial Aneurysm Stability and Growth: An Integrative Mechanobiological Framework for Clinical Cases
F. S. Teixeira et al., 2020, *Biomechanics and Modeling in Mechanobiology*, doi: 10.1007/s10237-020-01351-2 (online 12 June 2020)

Limitations of Incident Power Density as a Proxy for Induced Electromagnetic Fields
A. Christ et al., 2020, *Bioelectromagnetics*, 41(5):348-359, doi: 10.1002/bem.22268 (online 13 June 2020)

Pixel-Wise Assessment of Cardiovascular Magnetic Resonance First-Pass Perfusion Using a Cardiac Phantom Mimicking Transmural Myocardial Perfusion Gradients
X. Milidonis et al., 2020, *Magnetic Resonance in Medicine*, doi: 10.1002/mrm.28296 (online 13 June 2020)

Estimated Whole-Brain and Lobe-Specific Radiofrequency Electromagnetic Fields Doses and Brain Volumes in Preadolescents
A. Cabré-Riera et al., 2020, *Environment International*, 142(2020):105808, doi: 10.1016/j.envint.2020.105808 (online 15 June 2020)

A Calibrated Physical Flow Standard for Medical Perfusion Imaging
G. Kok et al., 2020, *Flow Measurement and Instrumentation*, in press

Response to Professor Enders’ Comment on “Discussion on Spatial and Time Averaging Restrictions Within the Electromagnetic Exposure Safety Framework in the Frequency Range Above 6 GHz for Pulsed and Localized Exposures”
T. Samaras et al., 2020, *Bioelectromagnetics*, in press